Assesment of Semen Parameters by CASA in Patients with Metabolic Syndrome.

Thesis

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By

Hisham Foaad Abdel Latif

(M.B.,B.ch.)- Cairo university

Under supervision of

Prof. Dr. Mohamad Tarek Anis

Professor of Andrology, Sexology & STDs
Faculty of Medicine
Cairo University

Dr. Ashraf Selim Zeidan

Lecturer of Andrology,Sexology & STDs
Faculty of Medicine
Cairo University

Dr. Nashwa Said Mohamad

Lecturer of Internal Medicine
Faculty of Medicine
Cairo University

Faculty of Medicine

Cairo University

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List Of Abbreviations

ALH	Lateral head displacement.
ATP	Adult treatment panel.
BCF	Beat cross velocity.
BMI	Body mass index.
CASA	Computer assisted semen analysis.
CASMA	Computer aided sperm morphometric assessment.
CE	Cholesterol ester.
CETP	Cholesterol ester transfer protein.
CRP	C- reactive protein.
CVD	Cardiovascular disease.
DFI	DNA fragmentation index.
ED	Erectile dysfunction.
FFA	Free fatty acid.
FSH	Follicle stimulating hormone.
HDL	High density lipoprotein.
IDF	International diabetic federation.
LDL	Low density lipoprotein.
LH	Leutenizing hormone.
LIN	Linearity.
LPO	Lipid peroxidase.
MAD	Mean angular displacement.
MCP-1	Monocyte chemoattractant protein 1.
NCEP	National cholesterol education program.
NEFA	Non esterified fatty acid.
NTSC	National television standard commite.

PAL	Phase alternating line.
RAS	Renin angiotensin system.
ROS	Reactive oxygen species.
SHBG	Sex hormone binding globilin.
STR	Straightness.
T	Testesterone.
VAP	Average path velocity.
VCL	Curvilinear velocity.
VLDL	Very low density lipoprotein.
VSL	Straight line velocity.
WC	Waist circumference.
W/H	Waist / hip ratio.
WHO	World of health organization.
WOB	Wobble.

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ABSTRACT

Introduction. Metabolic syndrome is an important medical and epidemiologic entity, Currently, there is sufficient evidence to suggest a Metabolic syndrome-male infertility paradigm

Aim. To clarify the correlation between Metabolic syndrome and male factor infertility ,showing its effect on seminal parameters.

Methods. The study was performed on 200 males , who were recruited from the outpatient clinic of Andrology and Diabetes, Cairo university hospital.100 of them had features of Metabolic syndrome according to the IDF definition and 100 not fulfilling the definition. History was taken , general and local examination applied, lipid profile and FBS measured and semen samples were analyzed according to the World Health Organization 2010 guidelines by using CASA apparatus.

Results. Males with Metabolic syndrome had poor semen quality regarding all seminal parameters as volume , sperm concentration, total motility, progressive motility and abnormal forms with a mean and standard deviation of 2.7±0.7 , 18.3±13.4 , 30.7±12.5 , 20.9±10 , 71.7±14.5 respectively, with a significant difference compared to control group (p value <0.001).
Among criteria of Metabolic syndrome : WC , FBS and HDL were found to affect semen more significantly than HTN and triglycrides.
Increased number of Metabolic syndrome components above 3 components is not associated with increased affection of seminal parameters .

Conclusion. Metabolic syndrome is associated with poor semen quality &severity of Metabolic syndrome is not associated with increased affection of seminal parameters .

Key Words. Metabolic syndrome- male infertility- CASA- waist circumference

Introduction And Aim of the Work

Introduction

Metabolic syndrome has become a major public health challenge worldwide **(*Eckel, 2005)***. The best available evidence suggests that people with Metabolic syndrome are at increased risk of cardiovascular disease (CVD).Thus, there has been growing interest in this constellation of closely related cardiovascular risk factors **(*Hoshino et al., 2008)***.

Grundy (2008) suggested that; the Metabolic syndrome confer approximately a 3-folds increased risk occlusive CVD in affected subject and the risk of developing type II diabetes is even higher.

In patients with manifest vascular disease, presence of Metabolic syndrome is associated with advanced vascular damage . So, among patients with CVD, those with Metabolic syndrome are at increased risk of subsequent vascular events as compared with those without ***(Saely et al., 2006*)**.

Key component of this syndrome include: central obesity, dyslipidemia , high blood pressure and impaired glucose metabolism. Several studies showed high prevalence of the metabolic syndrome in different high-risk populations ***(Isomaa et al., 2001)***, but the magnitude of the Metabolic syndrome became apparent when in an apparently healthy population a prevalence of nearly 24% was found (***Ford et al., 2002).***

The numerous deleterious effects of Metabolic syndrome are being investigated throughout the medical community, as Metabolic syndrome may potentially affect many aspects of human physiology due to its systemic nature***(Kasturi et al., 2008).***

Male factor infertility may represent one such perturbation in some male patients with metabolic syndrome. It is estimated that 15% of couples attempting to conceive are not able to do so within 1 year. Male factor infertility is present in 20%–50% of these couples, either independently or in conjunction with female factor infertility issues ***(Jarow et al., 2002).***

In the setting of an increasing prevalence and understanding of metabolic syndrome, investigators are actively studying the potential relationship between Metabolic syndrome and male factor infertility***(Kasturi et al., 2008).***

Aim of the work

Our aim in this work was to clarify the correlation between Metabolic syndrome and male factor infertility ,showing its effect on seminal parameters.

Review of Literature

Chapter (I)

Metabolic syndrome

Metabolic syndrome

Hanefeld and Leonhardt (1981) were the first to coin the term Metabolic syndrome (**Metabolic syndrome)**. Because this report was published in German and behind the ‘‘Iron Curtain,’’ it remained unnoticed by many scientists and clinicians. The authors stated that Metabolic syndrome represented the common prevalence of obesity, hyperlipoproteinemia , dyslipoproteinemia , maturity onset diabetes (typeII), gout, and hypertension associated with increased incidence of atherosclerotic vascular disease, fatty liver, and gallstones that develop on the basis of genetic susceptibility combined with over nutrition and physical inactivity.

The World Health Organization **(WHO) (1998)** developed a working definition for Metabolic syndrome by defining signs and symptoms that include dyslipidemia, hyperinsulinemia, and hypertension ***(Alberti and Zimmet, 1998)***.

The Adult Treatment Panel **(ATP III)** of the National Cholesterol Education Program **(NCEP) (2001)** modified the definition based on similar characteristics used by the **WHO** . The **ATP III** suggested that the primary treatment should focus on reduction of low-density lipoprotein (LDL) cholesterol levels, followed by the treatment of individual Metabolic syndrome symptoms that would lead to a decrease in the risk for congestive heart disease (***Kupelian et al.,2006b***).

A new worldwide definition for Metabolic syndrome was developed based on the International Diabetes Federation **(IDF)** Consensus Group held in Berlin in 2005 **.**

All three Metabolic syndrome definitions imparted similar cardiovascular disease and diabetes risks in a recent comparison from the San Antonio Heart Study ***(Lorenzo et al., 2007).***

Table (1): Diagnostic criteria for Metabolic syndrome in men according to various definitions

Met. Synd. Criteria	***WHO***	***NCEP-ATP11***	***IDF***
Required diagnosis	Criterion 1 plus 2of the other4	 ≥ 3 of 5 criteria	Criterion 2 plus 2 of the other4
1- Hyperinsulinemia hyperglycemia	FBS≥ 110mg/dl (≥6.1nmol/L)↑insulin or IR or TII DM	FBS≥ 110mg/dl (≥6.1nmol/L) or TII DM	FBS≥ 100 mg/dl or TII DM
2- Increased body size	WC≥ 94cm BMI≥ 30 WHR>0.90	wc≥ 102 cm	WC≥ 94cm
3- Triglyceride	≥150mg/dl (≥2.3mmol/L)	≥ 150 mg/dl (≥ 2.3 mmol/L)	≥ 150 mg/dl (≥ 2.3mmol/L)
4- HDL cholesterol	< 35 mg/dl (>0.9Nmol/L)	< 40 mg/dl (>1.03Nmol/L)	<40 mg/dl (>1.03nmol/L)
5- BP	≥ 140/90 mmHg or treatment	≥ 130/85 mmHg or treatment	Systolic ≥ 130mmHg diastolic≥ 85mmHg or treatment

Abbreviations: BMI, body mass index; BP, blood pressure; FBS, fasting blood sugar; HDL, high-density lipoprotein; HTN, hypertension, IDF, International Diabetes Federation; IR, insulin resistance; NCEP-ATP III, National Cholesterol Education Program-Adult Treatment Panel; WC, waist circumference; WHO, World Health Organization; WHR, waist-hip ratio**.**